



澳門大學
UNIVERSIDADE DE MACAU
UNIVERSITY OF MACAU

Newly offered programme in 2019/2020 academic year Bachelor of Science in Mathematics (Statistics and Data Science)

Introduction

Along the drastic advancement in science and technology in recent years, there is no dispute that the grasp of analysis and management of big data for all sectors has been in increasingly hot demand. To devise policies in urban planning and social development, effective and precise forecast in trends extracted from big flow of data is the key to successful strategy-making. To excel residents' living quality and economic growth, the Macao SAR government has set the objective to develop Macao into a smart city as characterized by data-driven technology and artificial intelligence. To this end, the University of Macau will offer a new programme - Bachelor of Science in Mathematics (Statistics and Data Science) in 2019/2020 academic year. This programme will equip students with solid knowledge in Mathematics which will be integrated with professional skills in analysis and management of Statistics and Data Science. The potential undergraduate graduates are expected to meet the talents needed for the upcoming big data era.

Features

- The programme covers a wide range of specialized areas including basic Mathematics, Practical Statistics, Data Management and Data Analysis.
- It provides professional training in Database Management, Data Storage and Statistical Analysis.
- The programme is specially designed for those who would like to have their career in Statistics, Data Science or Information Technology related industries.

Graduate Prospects

- Data and Statistics Analysis
- Decision & Strategy Analysis
- Marketing Research
- Finance
- Information & Data Management or Commercial Analysis
- Government and Service Related Sectors



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Admission Channel

- Applicants may apply for admission by one of the following channels, whichever is applicable to them:
 - ✓ Principals' Recommended Admission (Application period: 24 September – 12 October 2018)
 - ✓ Joint Admission Examination for Macao Four Higher Education Institutions (Application period: 3 – 18 January 2019)
 - ✓ Direct Admission (Application period: 3 December 2018 – 18 April 2019)
- Applicants can refer to the Registry's webpage at <https://reg.umac.mo/admission/> for details of application requirement.

Academic and Teaching Arrangement

1. Degree Award: Bachelor of Science
2. Area of concentration: Mathematics (Statistics and Data Science)
3. Programme Duration: 4 years
4. Minimum credit requirement for graduation: 132 credits and pass all required courses
5. Medium of instruction: English and Chinese
6. Programme curriculum for Bachelor of Science in Mathematics (Statistics and Data Science) listed as below:

Course	Type	Weekly Lecture Hours	Credits
<i>1st Academic Year</i>			
Linear Algebra I	Compulsory Major Course	4	3
Linear Algebra II	"	4	3
Programming Science	"	4	3
Discrete Structures	"	4	3
Intermediate Calculus	"	4	3
Languages & Skills Courses ^{1,2}	"	18	12
Community and Peer Education Courses ¹	"	--	2
General Education Course ¹	"	3	3
1 Free Elective ³	Free Elective	3	3
Total Credits			35



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Course	Type	Weekly Lecture Hours	Credits
2nd Academic Year			
Multivariable Calculus	Compulsory Major Course	4	3
Mathematical Analysis I	"	4	3
Mathematical Analysis II	"	4	3
Probability	"	4	3
Computational Statistics	"	4	3
Applied Statistics	"	4	3
Linear Statistical Analysis	"	4	3
Languages & Skills Course ^{1, 2}	"	3	3
Community and Peer Education Course ¹	"	--	1
General Education Courses ¹	"	6	6
2 Free Electives ³	Free Elective	6	6
Total Credits			37
3rd Academic Year			
Ordinary Differential Equation	Compulsory Major Course	4	3
Introduction to Database System	"	4	3
Introduction to Stochastic Processes	"	4	3
Data-driven Sampling Methods	"	4	3
Multivariate Data Analysis	"	4	3
General Education Courses ¹	"	9	9
3 required electives from the “Required Elective Course List” of Bachelor of Science in Mathematics (Statistics and Data Science)	Required Elective	12	9
1 Free Elective ³	"	3	3
Total Credits			36



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Course	Type	Weekly Lecture Hours	Credits
<i>4th Academic Year</i>			
Nonparametric Statistics	Compulsory Major Course	4	3
Final Year Project	"	3	3
General Education Courses ¹	"	6	6
1 required elective from the “Required Elective Course List” of Bachelor of Science in Mathematics (Statistics and Data Science)	Required Elective	4	3
3 Free Electives ³	"	9	9
Total Credits			24
Grand Total Credits			132

1. General Education course list will be posted on University of Macau’s website.
2. Students who test out of some of the “Languages and Skills course(s)” are required to make up the credits by taking additional Free Elective(s). Please refer to University of Macau’s website for the details of exemption application from taking “Language and Skills” courses.
3. Students can select any courses provided by home faculty or other faculties as free elective courses to fulfill credit requirement of Free Elective Course.



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**List of Required Elective Courses for
Bachelor of Science in Mathematics (Statistics and Data Science)**

Course	Weekly Lecture Hours	Credits
Introduction to Stochastic Calculus	4	3
Time Series Analysis	4	3
Statistical Techniques in Life Sciences	4	3
Applied Regression Analysis	4	3
Bayesian Method in Data Analysis	4	3
Data Mining and Statistical Learning	4	3
Design and Analysis of Experiments	4	3
Optimization for Big Data Inference	4	3
Topics in Statistics and Data Science	4	3
Algorithm Design and Analysis	4	3
Object Oriented Programming and Data Structures	4	3
Advanced Database System	4	3
Artificial Intelligence	4	3
Data and Information Visualization	4	3
Cloud Computing and Big Data Systems	4	3
Machine Learning	4	3
Pattern Recognition	4	3
Natural Language Processing	4	3